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# Labor Regulation and Employment in India's Retail Stores

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June 2008

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### **Abstract**

A new dataset of 1,948 retail stores in India shows that 27% of the stores find labor regulations as a problem for their business. Using these data, we analyze the effect of labor regulations on employment at the store level. We find that flexible labor regulations have a strong positive effect on job creation. Our estimates show that labor reforms are likely to increase employment by 22% of the current level for an average store. We also address the issue of informality in India's retail sector. Our findings suggest that more flexible labor laws can encourage firms to operate in the more efficient formal retail sector. According to our estimates, labor reforms could reduce the level of informality by as much as 33%.

**Keywords:** Labor regulations, India, Employment, Retail, Informality

**JEL Classification:** J080, K31, L81, O53

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## 1. Introduction

A large body of literature analyzes the effect of labor regulations on output and employment. For example, Botero et al (2004) look at labor laws in a cross section of 85 countries and find that more rigid regulation of labor is associated with lower labor force participation and higher unemployment. India finds a special place in this literature for its rigid labor laws.<sup>1</sup> Besley and Burgess (2004) find substantially reduced levels of employment, investment, productivity and output in the registered manufacturing sector of India due to stricter labor laws. Similar findings are reported by Ahsan and Pages (2007) for large manufacturing firms. A key question is whether one can find similar effects in other sectors of India and estimate their magnitudes. The present paper attempts to answer this question for the retail sector in India, the second largest employer after agriculture in the country.<sup>2</sup>

The literature mentioned above is primarily focused on the relationship between employment and labor regulation. However, this relationship is not obvious and requires empirical verification. For example, while stricter labor laws increase the cost of hiring labor, they also make it more difficult to fire workers. The former tends to slow down job creation while the latter reduces job destruction. Hence, the direction of the overall effect on employment is not certain (Blanchard and Portugal, 2001). Further, the effect of labor regulation may extend to factors other than labor employment. For instance, Almeida and Carneiro (Forthcoming) show that, for a sample of Brazilian firms, stricter enforcement

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<sup>1</sup> For example, the World Bank's Doing Business project ranks India at 112 of 175 countries on the rigidity of employment regulation (World Bank, 2006).

<sup>2</sup> The retail and wholesale sector is the second largest employer in India after agriculture accounting for over 9% of all jobs and its share in GDP equals 14% (Banga 2005, Gordon and Gupta 2004).

of labor laws alters firm characteristics such as size, use of informal labor, etc. These effects have a significant impact on the overall performance of the economy.

Another possibility is that labor regulations alter the composition of activity between the formal and informal sector. Stringent labor laws may encourage firms to operate in the informal sector where labor laws are hardly implemented. Similarly, if stricter labor laws reduce employment opportunities in the formal sector then some workers may seek work in the informal sector. The compositional shift (from formal to informal) is important because the informal sector is known to be less efficient than the formal sector and beset with a number of problems such as poor access to finance and contract-enforcement agencies (Djankov et al. 2003a), inefficiently small scale of production with little incentive to use modern technology, and lack of occupation and safety standards for workers.

One limitation of existing work on labor regulations is that it is based solely on labor laws as they exist on the books with no consideration given to their enforcement. Hence, findings in the literature would mean little if there is a dichotomy between laws on the books and their enforcement. The World Bank Enterprise Survey provides valuable information on how stores perceive the severity of labor regulations for doing business. 27% of the stores in the full sample reported labor regulations as an obstacle for their business with a high of 53% in the state of West Bengal, 42% in Rajasthan and 39% in Maharashtra. These numbers dispel the notion that labor laws are not implemented in the retail sector for, absent enforcement, labor laws would not be an obstacle for any store. We use these reported perceptions to construct a measure of enforcement of labor

laws and show that our results do not suffer from the potential weakness mentioned above.

The present paper contributes to the literature on labor regulation in two important ways. First, we focus on the service sector in a developing country. The existing work on labor regulations is focused on manufacturing sectors despite the fact that services sectors are known to be highly labor intensive, accounting for a majority of jobs across countries. The retail and wholesale sector in India is the second largest employer (after agriculture) providing jobs to 9.4% of all formal workers in the country. An adverse effect of labor regulations on employment in the sector can have a significant impact on overall unemployment in the country. Second, existing studies are based on macro data which raises concerns about possible heterogeneity across data points. Our use of micro data allows us to control for a number of store (firm) characteristics that vary within and across good and bad regulation states. We are also able to analyze possible heterogeneity in the effect of labor laws on employment across small vs. large stores and temporary vs. permanent employment.

Our findings on the effect of labor regulation on employment are consistent with the emerging literature on the institutions-performance nexus which Djankov et al. (2003b) refers to as “the new comparative economics”. The main theme of this literature is that with the collapse of socialism, the real comparison is now between various dimensions of the quality of institutions within capitalist countries. Studies in this literature show that economic outcomes are significantly affected by, for example, regulation of entry (Djankov et al. 2002), enforcement of creditor rights (Safavian and

Sharma 2007), enforcement of labor laws (Almeida and Carneiro, Forthcoming) and corruption (Bo and Rossi 2007).

The rest of the paper is as follows. In section 2 we discuss the structure of labor laws, describe our data and the estimation strategy. In sections 3 we report our main empirical findings for the level of employment at the store level. Section 4 contains the robustness checks. In section 5 we analyze the relationship between labor regulation and the level of informality. A summary of the main findings is provided in the concluding section.

## **2. Data and Main Variables**

We use store level data collected by the World Bank in 2006 (Enterprise surveys). The data consist of a stratified random sample of 1,948 retail stores (cross-section) operating in the formal sector and located in 16 major states and 41 cities of India.<sup>3</sup> The National Industrial Classification (NIC-1998, Industry Division 52) classifies retailers into those operating through established stores and the rest who usually operate from home. All stores in our sample belong to the former category.

The survey contains information on a variety of store characteristics such as annual sales, employment, availability of infrastructure, access to finance, etc. It also

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<sup>3</sup> The sampling frame for the survey was the list of retail stores regularly interviewed by AC Nielson for inventory verification on behalf of distributors of branded goods. This list covers stores in 41 cities across India for three major industry segments: Fast Moving Consumer Goods (FMCG) stores (traditional stores), consumer durable stores and the modern format stores. A definition of these industry segments is provided in Table 1. The sample was stratified according to segment-specific criteria. FMCG stores were stratified based on turnover, number of salesmen, number of FMCG product and the presence of cooling equipment. Consumer durable and modern format stores were stratified based on turnover. The sample size was determined so as to minimize the standard error in the sample variables, given the available resources for each surveying stratum. Once the sample size was determined, the sample was allocated to strata using Neymann's allocation rule. More information about the survey and methodology is available at [www.enterprisesurveys.org](http://www.enterprisesurveys.org).

reports on the store manager's perceptions about various aspects of the business climate such as the severity of labor regulations, tax rates and restrictions on store-hour operations. We exploit this rich set of information and complement with external data sources to show that our results are robust to a number of store, city and state characteristics.

### 2.1 *Dependent variable*

A definition of all the variables used in the regressions is provided in Table 1. Our main dependent variable is the number of employees working in a store during the fiscal year 2005-06 (*Employment*). We do not include the manager (usually the owner) of the store in *Employment*. Total employees include temporary and permanent workers (defined below). The mean value of *Employment* is 4.7 and the standard deviation equals 24.6. Across states, *Employment* is highest in the state of Andhra Pradesh (14.1) and lowest in Haryana (0.9). In separate regressions, we also use the number of permanent and temporary employees at the store level as dependent variables. Permanent employees are defined as all paid employees that are contracted for a term of one or more fiscal year and/or have a guaranteed renewal of their employment contract and that work 8 or more hours per day. Temporary workers are defined as all paid short-term (less than a fiscal year) employees with no guarantee of renewal of employment contract and that work 8 or more hours per day. We expect the effect of labor regulations to be much stronger (more negative) on permanent than temporary employment since labor regulations are directed mostly towards permanent employees.

## *2.2 Labor Laws in India's retail sector*

Our main explanatory variable is an index of labor regulations for the retail sector in India. We provide a brief description of these regulations to motivate the analysis that follows. Labor regulations for India's retail sector fall under the jurisdiction of the state governments and are contained in the Shops and Establishments Act (SEA). The SEA is a state legislation and contains various laws relating to working conditions of the employees. The main provisions of the Act include compulsory registration of shop/establishment within thirty days of commencement of work, minimum wages, regulation of hours of work per day and week, guidelines for spread-over, rest interval, opening and closing hours, closed days, national and religious holidays, overtime work, rules for employment of children, young persons and women, rules for annual leave, maternity leave, sickness and casual leave, etc., rules for employment and termination of service; obligations of employers, obligations of employees, communications of closure of the establishment within 15 days from the closing of the establishment.

In Table 2 we report on the level of minimum wages prescribed in the various state SEAs along with the ones for some of the manufacturing sectors. The table reveals that minimum wages in retailing are not too different from the ones in the manufacturing sectors. To get a better idea of what specific provisions in the SEA entail, we list some of these provisions for the state of Maharashtra, the most prosperous state and the retailing hub of India. Retail shops in the state are covered by the Bombay Shops & Establishments Act of 1948. The Act was established in 1937 but underwent substantial changes in 1948 and some modifications thereafter. Currently, the Act stipulates that under normal circumstances an employee cannot be required or allowed to work for more



than nine hours in a day and 48 hours in a week (Section 14), any work beyond the stipulated working hours (overtime work) must be paid at double the normal wage rate of the employee, an employee must be allowed an interval of rest of at least one hour after five hours of continuous work (Section 15) and his spread-over cannot exceed eleven hours in a day (Sub-sections 16 & 17), every shop must remain closed on one day of the week and no deduction of wages is to be made for the closing day (Section 18), women are not allowed to work either as employees or otherwise after 9:30 p.m. (Sub-sections 33 & 34A), young people in the age group of 15-17 years are not allowed to work after 7 p.m. and for more than six hours in a single day (Sections 33, 34 & 34A), an employee is entitled to annual leave with pay for 21 days for 240 days of work (Sub-sections 35-37) and all provisions of the Maternity Benefit Act of 1961 and Workmen's Compensation Act of 1923 apply to every shop covered by the Act.

One concern is whether labor laws in the SEA are actually enforced. The Enterprise survey provides valuable information on this point. Specifically, stores were asked the following: "Are labor regulations no obstacle, minor obstacle, moderate obstacle, major obstacle or very severe obstacle to the current operations of the store?" Answers to the question were recorded on a 0-4 scale with a higher score implying a greater obstacle. Labor regulations are unlikely to be a problem for the employers if they are not enforced. For the full sample, 27% of the stores reported labor regulations to be a problem (minor or more). For these 27% of the stores, roughly one third find labor regulations as more than a minor problem. At the high end, 53% of the stores in West Bengal, 44% in Rajasthan, 39% in Maharashtra and 33% in Delhi report labor regulations as a problem. Corresponding figures for labor regulations as more than a minor problem

are 25%, 12%, 10% and 17%, respectively. Figure 1 shows the percentage of all stores who find labor regulations as obstacles for all the states in our sample. These numbers suggest a substantial enforcement of labor laws and that a substantial number of retail stores find labor regulations as burdensome, a finding which is confirmed in other surveys too.<sup>4</sup>

### 2.3 Explanatory variables

A list of the main explanatory variables, summary statistics and correlations between them is provided in Table 3. We use two separate measures of labor regulation. The first measure, the *Regulation* index, is an index of labor laws for the manufacturing sectors in India due to Besley and Burgess (2004).<sup>5</sup> The motivation here is that labor laws are to a large extent determined by political factors which are likely to be similar across manufacturing and services sectors like retailing. That is, governments that are likely to implement rigid labor laws in manufacturing are also likely to implement rigid labor laws in retailing.

The *Regulation* index is based on laws on the books and does not capture their actual enforcement. Also, there could be a concern that the index is not specific to the retail sector. We address these problems using a second measure of labor regulation, the *Enforcement* index, derived from store's perceptions about the severity of labor laws. Specifically, the *Enforcement* index equals the state level average of the scores reported by stores on the labor regulation as an obstacle question mentioned above. We note that

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<sup>4</sup> For example, KPMG recently conducted a survey of retail firms in India (KPMG, 2005). This report shows that in the "Fast moving consumer goods" section of retailing about 35% of the firms reported labor regulations as a significant problem (p. 19). These stores account for 80% of consumer spending in the country.

<sup>5</sup> We use year 2000 values of the *Regulation* index which is the latest year for which the index is available.

store's response to the question will depend on the severity of labor laws (on the books), their enforcement and, to some extent, their characteristics (age, etc.). Averaging helps in filtering out the influence of store characteristics on the index leaving us with a measure of labor laws on the books cum enforcement. We complement the filtering process by directly controlling for a large number of store characteristics (age, level of competition, etc.) in the regressions. One could argue that using information from within the survey to construct the *Enforcement* index may exacerbate endogeneity concerns. However, this is also an advantage because information on factors that may exacerbate the endogeneity problem is also available in the survey and we can use this information to control for these factors.

There is substantial variation in the *Enforcement* index across states ranging from 0.109 (Haryana) to 0.81 (West Bengal). The mean value of the index equals 0.345 and the standard deviation equals 0.194 (Table 3). Figure 2 shows the full distribution of the index across states. As we might expect, the two labor regulation indices are positively correlated upto 0.473. Without much loss of generality, we will use the terms labor laws and labor regulation synonymously with the *Regulation* index and the *Enforcement* index. Distinction between the two indices is made where necessary.

Since the labor regulation indices are defined at the state level, direct reverse causality from *Employment* (which varies at the store level) to labor regulation is unlikely. However, it is possible that the labor regulation indices may be correlated with other determinants of *Employment* implying an omitted variable bias in our estimation. We check for this problem in two ways. First, by directly controlling for a large number of variables at the store, city and state level. Second, we contrast the effect of labor

regulations on temporary and permanent employment. We expect labor regulations to affect employment of these two types of workers differently (as discussed above), a result that is unlikely if the labor regulation indices were picking up the effect on employment of overall development, store characteristics, etc.

### *2.3.1 Other explanatory variables*

One concern with estimating the effect of labor regulation on employment could be that the labor regulation indices may pick up differences in income levels across states. States with higher income levels are likely to have better physical and financial infrastructure, quality of institutions, etc., which should have a positive effect on the marginal productivity of labor and therefore the level of employment (confirmed below). However, correlation between our labor regulation indices and current (2003-04) per capita income of states (*Income*) is also positive equaling 0.060 for the *Regulation* index and 0.223 for the *Enforcement* index. The structure of correlations here implies that failure to control for income level (and its covariates) is likely to bias the estimated coefficient of the labor regulation indices towards zero (confirmed below).

A second problem with the estimation could arise due to a correlation between the severity of labor regulation and wage rate or the opportunity cost of labor. Of course, part of the wage differential across states is likely to reflect differences in the underlying labor laws (minimum wages) but some of it could be due to differences in labor supply and demand conditions that have little to do with labor laws. We resolve the identification problem by showing that our results for the effect of labor regulation on employment hold with and without controlling for wage rate. Since wage rate captures some aspects of

labor laws, we expect the negative effect of labor laws on employment to fall (become less negative) when we control for the wage rate. Hence, on this count, the results for labor regulation-employment relationship discussed below are on the conservative side.

Our measure of wage rate equals total labor cost divided by total labor employment in all manufacturing sectors at the state level (*Wage rate*). Data source for the variable is Annual Survey of Industries (2003-04). To ensure that our results are not sensitive to the wage rate in the manufacturing sectors, we checked all our results with an alternative wage measure which is same as above but derived from the survey of the services sectors conducted by the National Sample Survey Organization (NSSO, 56<sup>th</sup> round). Our main results are roughly similar with either of these wage measures but the manufacturing wage rate shows a stronger effect on employment.

Our next control is total population of the city in 2001 (*Population*). Larger cities in India (in terms of population) are known to be richer, more developed and the main beneficiaries on the ongoing retail boom. We treat *Population* as a proxy for the level of overall development of cities complementing the *Income* variable.

Our last control in the main specification is age of the store (*Age*). Older stores are known to be more efficient and larger due to learning by doing or selection related effects. Hence, we expect a positive relationship between age and employment. This could create a bias in the estimated effect of labor regulation on employment if the age structure varies systematically with the stringency of labor laws. One possibility here is that younger stores may be more sensitive to changes in labor laws than older stores because the former have less location specific sunk cost. If this is indeed true then we expect age and the severity of labor regulations to be inversely correlated (younger stores

choosing to locate in less regulated states) while the direct effect of age on employment is likely to be positive. The structure of correlations here suggests that failure to control for age is likely to bias the estimated coefficient of the labor regulation indices towards zero. Our results below confirm such a downward bias although its magnitude is small, implying that labor regulation is not too important for store's location choice.<sup>6</sup>

### 3. Estimation

Our base regression is the following

$$\begin{aligned} Employment_i = & \alpha_0 + \beta Regs_s + \alpha_1 Income_s \\ & + \alpha_2 Wage\ rate_s + \alpha_3 Population_c + \alpha_4 Age_i + u_i \end{aligned}$$

$i$  denotes a store,  $s$  the state and  $c$  the city in which it is located,  $Employment_i$  is total employment in store  $i$ ,  $Regs_s$  is the index of labor regulation (*Regulation* index and the *Enforcement* index in separate regressions) and  $u_i$  is the error term. The remaining variables in the equation are as defined above. The coefficient of interest is  $\beta$  which we expect to be negative. It captures the impact on employment of a unit increase in the labor regulation index. In all our regressions we use Huber-White robust standard errors clustered on the state.<sup>7</sup>

#### 3.1 Base regression results

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<sup>6</sup> This result is not surprising. Most retailers in India are small and they usually operate in their city of residence (birth). Further, e-commerce is still rare in the country which makes it difficult for stores to operate remotely (from less labor regulated states).

<sup>7</sup> Our results do not change if we cluster the errors on the city. Clustering lowers the t-statistic of our coefficients of interest.

Estimation results using the *Regulation* index are reported in Table 4. Irrespective of the controls, the estimated coefficient of the *Regulation* index is negative and significant at either less than or close to the 1% level. Without any additional controls, the estimated coefficient of the index equals -0.471 with a p-value of 0.012 (column 1, Table 4). The estimate implies that lowering the severity of labor regulation from its median to the lowest value increases employment (per store) by 1.18 persons or 25% of the mean level of employment.

The results do not change much when we control for the remaining variables discussed above. Controlling for state per capita income, the estimated coefficient of the labor regulation index increases (in absolute value) from -0.471 to -0.511 and it is significant at less than 1% level (column 2, Table 4). The increase in the coefficient value is consistent with our prediction above that failure to control for income or overall development of states is likely to bias the estimated effect of labor regulation on employment in the downward direction. Further, income shows a positive effect on employment although this is not too significant (p-value of 0.131). In column 3 of Table 4 we add wage rate to the specification. As expected, higher wage rate has a negative effect on employment, significant at less than 5% level (p-value of 0.040). The estimated coefficient of the labor regulation index declines from -0.511 to -0.426 but remains significant at the 1% level. Controlling for population (column 4, Table 4), we find that it has only a weak positive effect on employment (p-value of 0.469) and, like income, it causes the estimated coefficient of the labor regulation index to increase (from -0.426 to -0.472) without much change in its significance level. Lastly, we control for age of the store (column 5, Table 4). Age shows a positive effect on employment significant at less

than 10% level (p-value of 0.098). However, controlling for age does not make much difference to the estimated coefficient of the *Regulation* index which shows only a slight increase from -0.472 above to -0.499 (p-value of 0.006). The small increase here confirms our prediction above that self-selection of stores across good and bad labor regulation states is unlikely to affect our main results much.

If we take the most conservative estimate of the coefficient of the *Regulation* index (in column 3 of Table 4), it implies that reducing the severity of labor laws from its median to the lowest value would increase employment in the sector by 22.7% of the current mean level. These findings suggest that labor reform in India's retail sector could have a significant effect on overall employment in the country given that the sector is the second largest employer (after agriculture) accounting for over 9% of all jobs.

### 3.2 *Enforcement index*

Corresponding results using the *Enforcement* index are provided in Table 5 and these are roughly similar to the ones we found above for the *Regulation* index. The estimated coefficient of the *Enforcement* index is negative and significant at less than 5% level in all the specifications and varies between -2.97 and -3.45. These estimates imply that lowering the *Enforcement* index from its median value (0.330) to the lowest value (0.109) will cause employment to increase in the range of 14-16 percent of the mean level of *Employment*.

Results for the remaining controls are also roughly similar to what we found above. Age has a positive effect on employment (significant at less than 5% level) while higher wages lower employment (significant at close to 5% level). *Income* and



*Population* show positive effects on employment but neither of these effects is significant at 10% level or less. Lastly, the estimated coefficient of the *Enforcement* index rises from -3.28 (column 1, Table 5) to -3.44 (column 2, Table 5) when we control for state per capita income, it falls from -3.44 to -2.97 (column 3, Table 5) when we control for the wage rate, it rises from -2.94 to -3.45 when we control for the age of the store and it is virtually unaffected by the population control..

### 3.3 Large vs. small stores

One concern with the results could be that the negative effect of labor regulation on employment may be restricted to the relatively large stores with smaller stores experiencing no such effect. This is more worrisome for the *Enforcement* index since labor inspectors are more likely to target large than small stores. We experimented by dropping from the sample the largest 25% of the stores (in terms of floor area of the shop) and also by restricting the sample to the smallest 25% of the stores. The mean value of *Employment* for these sub-samples equals 2.1 (largest 75% of the stores) and 1.25 (smallest 25% of the stores).

Regression results for these sub-samples showed negative effects of the two labor regulation indices significant at less 5% level (not shown) for all the specifications discussed above. However, the absolute magnitudes of these effects were smaller than what we found above for the full sample. For example, controlling for all the variables discussed above, the estimated coefficient of the *Regulation* index equals -0.499 for the full sample above, -0.166 (significant at less than 1% level) for the smallest 75% of the stores and -0.073 (p-value of 0.002) for the smallest 25% of the stores. The

corresponding figures for the *Enforcement* index equal -3.45 (full sample above), -0.783 (p-value of 0.047, smallest 75% of the stores) and -0.487 (p-value of 0.001, smallest 25% of the sample).

All these effects are economically large and not too different when expressed as a percentage of the mean level of employment in the various samples. A decrease in the *Regulation* index from its median to the lowest value increases employment by 26.5% of the mean level of employment for the full sample (column 5, Table 4), 19.6% of the mean level of employment for the smallest 75% of the stores and 14.6% of the mean level of employment for the smallest 25% of the stores. The corresponding figures for the *Enforcement* index are 16% (full sample), 12.3% (smallest 75% of the stores) and 12.8% (smallest 25% of the sample), respectively. Hence, the negative effect of labor regulation on employment is not restricted to the relatively large stores.<sup>8</sup>

#### **4. Robustness**

Employment at the store level depends on the marginal productivity of labor vis-à-vis the marginal cost of labor. The list of factors which may affect the marginal benefit/cost of labor can be quite large. In this section we control for a number of such factors to ensure that the adverse effect of labor regulation on employment that we found above is not spuriously driven by omitted variables. We focus on the results for the *Regulation* index which are reported in Table 6. Regression results for the *Enforcement* index follow a similar pattern and are reported in Table 7.

##### *4.1 Income and overall development of cities*

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<sup>8</sup> These results do not depend on the controls for income, wage rate, population and age.

In the specifications above we control for the current per capita income of the states and the total population of cities as a proxy for overall development. We complement these measures with three additional proxy measures of city level incomes and development which are the proportion of adults that are literate (*Literacy*), ratio of females to males (*Sex ratio*) and per capita expenditure (*Expenditure*). Literacy rate and sex ratio are defined at the city level and we use 2001 values of these variables taken from Census of India (2001). For expenditure, we use data from the 56<sup>th</sup> round (1999-2000) of the National Sample Survey Organization (NSSO). The NSSO routinely conducts nationally representative household surveys of expenditure levels which are reported at the district level.<sup>9</sup>

Controlling for literacy, sex ratio and expenditure level along with all the variables discussed above, we find that the estimated coefficient of the *Regulation* index does not change much. It decreases in value from -0.499 above to -0.441 (column 1, Table 6) but remains significant at less than 5% level (p-value of 0.032). Literacy, sex ratio and expenditure show positive effects on employment but none of these is statistically significant at 10% level or less. There is not much change from above in the estimated effects of the remaining variables in the specification.

#### 4.2 Recessiary and Expansionary trends

Business cycles (recessions and expansions) may affect employment with a substantial lag. Hence, current per capita income and other proxy measures of overall development

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<sup>9</sup> The NSSO survey reports expenditure levels separately for the rural and urban parts of the district. We use estimates for the urban district population since it more closely resembles the cities in the Enterprise surveys. Our results do not change much if we use expenditure levels for the entire (rural plus urban) district.

discussed above may not fully control for the effect of business cycles on employment. We experimented by controlling for lagged values of state per capita income, population, etc. However, this made no difference to our results mainly because current and lagged values of income, etc., are highly correlated with one another. For example, the correlation between current per capita income of the states (*Income*) and its 10 year lagged value (1993-94 value) equal 0.965. We found similar correlation coefficients (above 0.90) between current and lagged values of literacy rate, sex ratio and population.

#### *4.3 Business climate*

In a series of questions, the Enterprise survey asked stores if tax rates, corruption, land laws, restrictions on store hour operations and obtaining licenses and permits were an obstacle for their business. Store's responses to these questions were recorded on a 0-4 scale defined as no obstacle (0), minor obstacle (1), moderate obstacle (2), major obstacle (3) and a very severe obstacle (4). As for the *Enforcement* index, we use state level average value of the reported scores on these questions as an index of the overall business climate or business regulations in the state (*Business regulations*). For additional robustness, we also control for the incidence of theft in the cities defined as the proportion of stores in the city that reported one or more incidence of theft during the fiscal year 2005-06 (*Theft*). We interpret *Theft* broadly to include its potential covariates such as crime, payment of protection money to mafia and law and order situation.

Regression results with *Business regulations* and *Theft* added to the previous specification are reported in column 2 of Table 6. As expected, both these variables show negative effects on employment but these effects are not too strong (significant between

10-20% level). The estimated coefficient of the *Regulation* index here remains negative and significant at less than 5% level although it declines in value from -0.441 above to -0.328. There is not much change in the estimated effects of the remaining variables.

#### *4.4 Infrastructure, contract enforcement and market competition*

We next control for measures of physical infrastructure availability, contract enforcement and the level of competition faced by stores. For infrastructure we use hours of power outage faced by stores per day on an average during the fiscal year 2005-06 (*Outage*). Power outages were voted as the single most important problem by the stores. For contract enforcement, we use percentage of store's total sales that were never paid for (*Non payment*). The level of competition in the retail sector depends upon a number of factors such as the number of retail shops in a given area, intensity with which consumers search with best prices, etc. In one question, stores were asked how important is the influence of domestic competitors operating in the formal sector over prices of the store's main products. We define *Formal competition* as a dummy variable equal to 1 if a store reported important or very important on this question and 0 otherwise (not at all important or slightly important). We note that a similar question was asked about competition from informal traders (*Informality*) which we discuss in more detail below.

Regression results controlling for outage, non-payment and formal competition along with all the variables discussed above are reported in column 3 of Table 6. Non payment shows a sharp negative effect on employment, significant at less than 1% level. However, there is no significant effect of power outages or formal competition on employment. The *Regulation* index continues to show a negative effect on employment

significant at less than 5% with little change in its magnitude (-0.317 compared to -0.328 above).

#### *4.5 Product lines*

So far we have not said anything about the type of products sold by stores. Employment level is likely to differ between stores selling grocery items and consumer durables. If the distribution of these store-types varies across good and bad labor regulation states then the estimated effect of labor regulation on employment discussed above could still suffer from an omitted variable bias.

As mentioned in section 2, the survey classifies stores into three types: traditional stores, consumer durable stores and modern format stores. We use store-type fixed effects (defined in Table 1) which indicate whether a store is a traditional store or a modern format store (with consumer durable stores as the omitted category). Controlling for store-type fixed effects along with all the other variables discussed above did not change our main results significantly. The estimated coefficient of the *Regulation* index increased from -0.317 above to -0.399 with a p-value of 0.024 (not shown).

#### *4.6 Time spent on regulations*

Our next control is the percentage of store's senior management's time that is spent in dealing with various business regulations (*Time*). There are two important issues that are related to this variable. First, higher values of the variable suggest more cumbersome and stringent business laws. Hence, *Time* could serve as an additional proxy measure of the business climate (Fisman and Svensson 2007). A second issue with *Time* relates to the

work of Bo and Rossi (2007). The authors look at the efficiency (total factor productivity) of public utilities in Latin America and show that it is inversely correlated with the level of corruption in the country. They argue that corruption diverts labor-time from production to bribing the government officials and as a consequence, output falls. To cover up for lost labor-time and output, firms expand employment. Hence, the net effect of higher corruption is increased employment but lower efficiency. This creates a paradoxical situation: corruption, stringent labor laws and other burdensome regulations may increase employment but this extra employment is not gainful or economically efficient. One implication of this is that the negative effect of stricter labor laws on gainful employment may be bigger than on total employment.

Our regression results confirm the logic of Bo and Rossi with an important caveat. *Time* has a positive effect on employment significant at less than 1% level (not shown). Also, controlling for *Time* increases the estimated coefficient of *Business regulations* index from -0.752 (p-value of 0.326) in the previous specification to -1.11 (p-value of 0.091). However, the estimated coefficient of the *Regulation* index falls in magnitude from -3.99 above to -0.369 (p-value of 0.021). In short, more stringent labor laws do not seem to increase non-gainful employment in the sense of Bo and Rossi but other business regulations do. Regression results for the remaining variables do not change much from above.

#### 4.7 Floor area of the shop

So far we have said nothing about the most important characteristic of stores which is the floor area of the shop (*Size*). In our sample, the correlation between *Size* and *Employment*

equals 0.435. It is possible that differences in rental rates or availability of land correlated with the severity of labor regulations could cause a spurious correlation between employment and labor regulations. *Size* is also likely to be correlated with a number of store attributes such as access to fiancé, stock of inventories maintained by the store, etc., which could have direct effects on the level of employment. As a robustness check against these potential identification problems, we controlled for the floor area of the shop and found that our main results remained intact. These results are reported in column 4 of Table 6. As expected, *Size* has a positive effect on employment, significant at less than 1% level. We note that controlling for *Size* lowers the estimated effect of the *Regulation* index from -0.369 above to -0.345 (column 4, Table 6). This decline suggests that stricter labor laws cause both, employment and floor area to shrink. Hence, part of the decline in employment is wiped out when we control for floor area.

#### 4.8 Additional robustness checks

We added a number of variables to the list of controls above and found that our main results did not change much. Briefly, these variables include: a dummy variable equal to 1 if a store has a checking or savings account and 0 otherwise, dummy variable equal to 1 if a store did not borrow from external sources during the last fiscal year because it felt no need to do so (financially independent) and 0 otherwise, a dummy variable equal to 1 if a store is part of a larger chain and 0 otherwise, percentage of the store owned by the largest shareholder, proportion of floor area that is owned as opposed to rented and years of experience of the store's manager in retailing. With all these controls, the estimated coefficient of the *Regulation* index equaled -0.339 (p-value of 0.012) compared to -0.345



in the previous specification (column 4, Table 6) above.<sup>10</sup> Lastly, we controlled for the level of informality (*Informality*) which caused the coefficient of the *Regulation* index to decline from -0.339 to -0.315 (p-value of 0.020). The decline was entirely because of difference in sample size due to missing observations on informality.<sup>11</sup>

#### 4.9 Large vs. small stores

Next, we check whether the negative effect of labor regulation on employment continues to hold for the relatively smaller stores or not. Controlling for all the variables discussed above (specification in column 4, Table 6), the estimated coefficient of the *Regulation* index equaled -0.120 (p-value of 0.001) for the smallest 75% of the stores and -0.098 (p-value of 0.006) for the smallest 25% of the stores. For a comparison, the corresponding value for the full sample equals -0.345 (column 4, Table 6). Results using the *Enforcement* index are similar. The estimated coefficient of the index equals -2.82 (p-value of 0.030) for the full sample (column 4, Table 7), -1.24 (p-value of 0.001) for the smallest 75% of the stores and -1.27 (p-value of 0.001) for the smallest 25% of the stores.

#### 4.10 Temporary versus permanent employment

We argued above that labor regulations are directed mostly towards permanent workers. One implication of this is that the negative effect of labor regulations should be stronger on permanent than temporary employment. Our results confirm this view (Table 8).

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<sup>10</sup> We also controlled for the level of informality in the retail sector (*Informality*) as defined in section 5 and Table 1. However, this did not change our results much. The estimated coefficient of the *Regulation* index declined from -0.339 to -0.315 (p-value of 0.020) but this decline was entirely due to the difference in sample size (missing observations on *Informality*). The corresponding change for the coefficient of the *Enforcement* index was a marginal increase from -2.74 (p-value of 0.022) to -2.95 (p-value of 0.011).

Columns 1-4 of Table 8 show the effect of the labor regulation indices on permanent employment (with and without the various controls). These results are roughly similar to what we found above for total employment except that the estimated coefficients of the labor regulation indices are smaller. Corresponding results for temporary employment are provided in columns 5-8 of Table 8. The estimated coefficients of the *Regulation* index and the *Enforcement* index are much smaller and statistically insignificant here.<sup>12</sup>

## 5. Labor regulation and Informality

In this section we analyze the relationship between informality and labor regulation for the retail sector in India. As discussed in the introduction, the hypothesis is that stricter labor regulation implies fewer jobs in the formal (retail) sector which pushes some of those unable to find such jobs to operate in the informal sector.

The Enterprise survey covers stores that operate only in the formal sector but it does provide information on the level of competition faced by stores from informal traders. Specifically, stores were asked: “For this store, how important is the pressure/influence from unorganized trade (hawkers, traders sitting on pavement, people selling from home, people selling spurious goods) over prices of its main products?” The response was recorded on a 1-4 scale defined as not at all important (1), slightly important (2), fairly important (3) and important (4). Using store responses on the question, we define *Informality* as a dummy variable equal to 1 if a store reported important or fairly important on the question above and 0 otherwise. The mean value of *Informality* is 0.189 and the standard deviation equals 0.391.

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<sup>12</sup> The contrasting results for permanent and temporary employment discussed here remain unchanged if we control for the variables discussed in section 4.8 (informality, managerial experience, etc) but not included in Table 8.

Regression results using a logit specification with *Informality* as the dependent variable are reported in Table 9. The results show a positive and significant effect (at less than 5% level) of stricter labor regulations on the incidence of informality and this holds for both the labor regulation indices and irrespective of the set of controls. The estimated effect is economically large. For the *Regulation* index, we find that an increase in its value from the lowest to the median level raises the incidence of informality in the range of 7.3 to 11.3 percentage points (against the mean of 18.9%). The corresponding range for the *Enforcement* index is 5.3 to 7.6 percentage points.

For the remaining controls, we find that larger cities (higher values of *Population*) show significantly lower levels of informality (significant around 5% level). We also find a negative effect of higher literacy rates on informality but this result is statistically weak. Similarly, we do not find any significant effect of infrastructure (power outages), age of the store and wage rate on informality.

In contrast to these weak effects, measures of the business climate show significant effects on informality. For example, higher values of *Theft* are associated with more informality (significant at less than 1% level), more time spent in dealing with business regulations (a measure of regulatory burden) is associated with higher levels of informality, significant at close to 10% level (columns 3 and 6, Table 9). Similarly, more burdensome business regulations tend to increase informality (significant at less than 5% level, column 3, Table 9).<sup>13</sup> We believe that these results along with the ones for labor regulation provide ample support for the view that excessive regulation promotes informality.

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<sup>13</sup> The estimated effect of *Business regulations* on *Informality* is significant only when we use the *Regulation* index (column 3, Table 9) but it is insignificant when we use the *Enforcement* index (column 6, Table 9).

Before concluding, we discuss two additional points about the set of controls used in this section. First, we have controlled for the level of competition in the formal sector (*Formal competition*) to eliminate any lingering concern that cities with more stringent labor laws may happen to be the ones that specialize in retailing (more formal and informal retailing activity). Second, the specifications discussed above did not control for the level of unemployment in the city. The implied assumption is that although unemployment may be positively correlated with the stringency of labor laws, it does not have a direct effect on informality. To ensure that our results above are not affected by this assumption, we controlled for the level of unemployment (city level values for 2001) in all the specifications listed in Table 9. None of the results discussed above were affected by this.<sup>14</sup> We found a weak positive effect of unemployment on informality (significant at less than 10% level) in some of the specifications but even this weak effect was not robust to some of the controls such as literacy and population.

## 6. Conclusion

A number of studies have shown that burdensome labor regulations can hinder job creation. These studies are largely confined to the manufacturing sectors and use macro data. The present paper finds similar evidence for a service sector (retailing) using micro data. Our results show that labor regulations in India's retail sector are detrimental to job creation and that labor reforms could increase employment in the sector by as much as 22% of the current level for an average store. This is a large effect when we take into

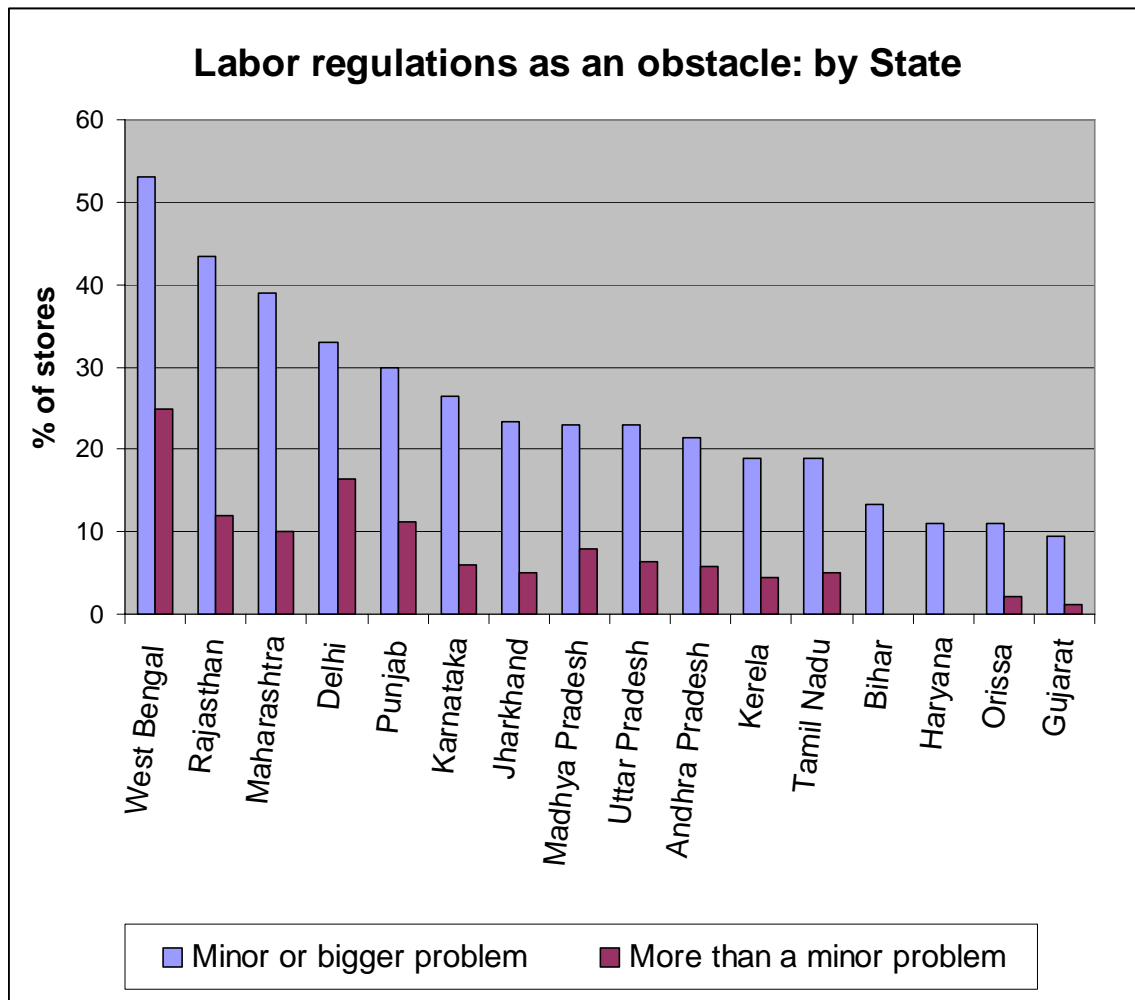
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<sup>14</sup> For example, adding unemployment to the list of all other controls discussed above (specification in column 3, Table 9), the estimated coefficient of the *Regulation* index increased marginally from 0.028 (column 3, Table 9) to 0.029 and remained significant at less than 1% level. The corresponding change for the *Enforcement* index was a decline from 0.227 (column 6, Table 9) to 0.209 (p-value of 0.006). In both these cases, the estimated coefficient of unemployment was statistically insignificant at 10% level or less.

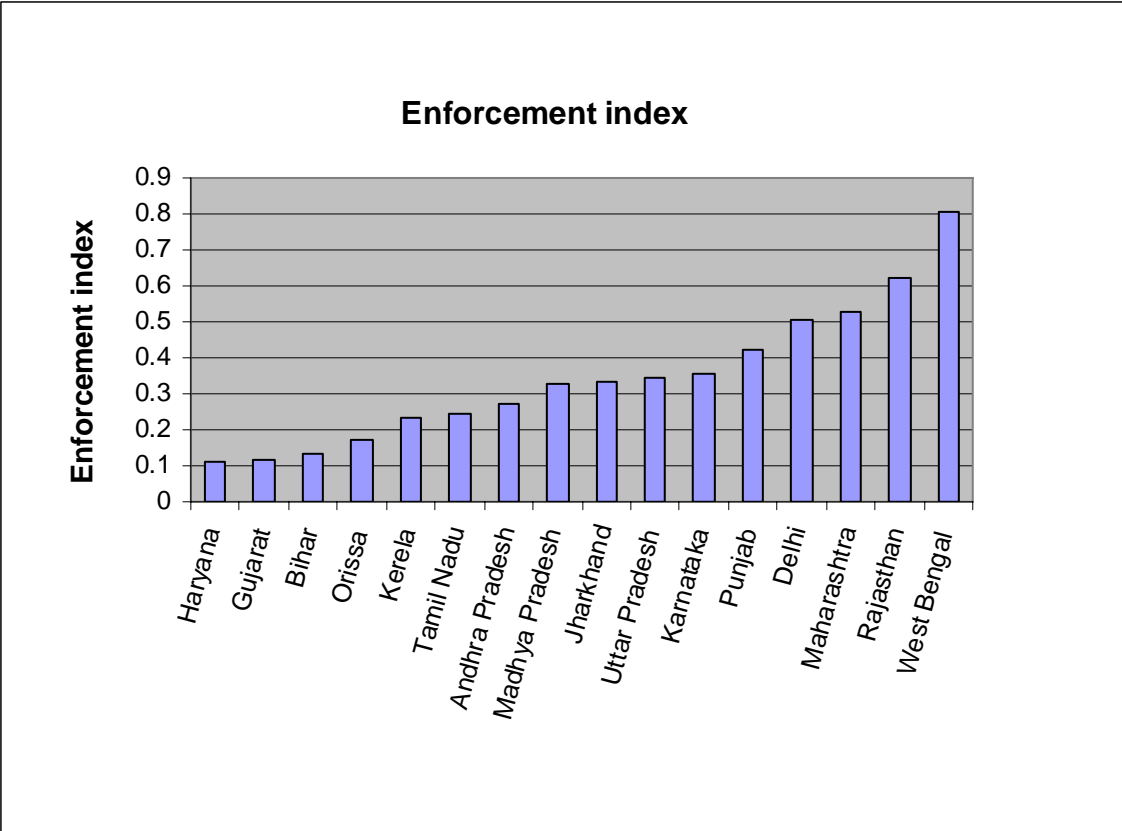
account the fact that the retail sector in India is the second largest employer providing jobs to 9.4% of all workers. We also studied the issue of informality in India's retail sector. The development of modern retailing in the country hinges crucially on a transition from the informal to the formal retail sector. Our results show that more stringent labor regulation promotes informality and that labor reforms may be necessary to achieve the transition.

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**Figure 1**



**Figure 2**



**Table 1: Description of Main Variables**

<p>“Last fiscal year” below means fiscal year 2005-06.  1 Indian Rupee (Rs.) = .025 USD as on 02/06/2008.</p>	
Variable	Description
<i>Employment</i>	Total number of workers working in the store in the last fiscal year as reported by the respondents in the Enterprise Survey. Source: World Bank Enterprise Surveys (www.enterprisesurveys.org)
<i>Informality</i>	A dummy variable equal to 1 if a store reported important or fairly important and 0 otherwise for the following question: For this store how important is the pressure/influence from unorganized trade (hawkers, people selling from home, people selling spurious goods, traders sitting on pavement) for prices of its main products: not at all important, slightly important, fairly important or important. Source: World Bank Enterprise Surveys (www.enterprisesurveys.org)
Labor regulation indices ( <i>Regs</i> )	
<i>Regulation</i> index	An index of labor laws in formal manufacturing in India due to Besley and Burgess (2004). We use year 2000 values of the index which is the latest available. The index is not available for the state of Delhi.
<i>Enforcement</i> index	State level average value of the scores reported in the Enterprise Survey for the following question: “Are labor regulations No Obstacle, a Minor Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this store?” The scores for these choices are from 0,1,2,3 and 4, respectively. Higher values of the index imply more pro-worker laws. Source: World Bank Enterprise Surveys (www.enterprisesurveys.org)
<i>Age</i>	2006 minus the year shop was established. Source: World Bank Enterprise Surveys (www.enterprisesurveys.org)
<i>Income</i>	Per capita income of the states in 2003-04 at 1993-94 constant prices (log values). Source: Reserve Bank of India, based on CSO data.

**Description of Other Variables**

Variable	Description
Permanent employment	Number of permanent employees at the end of last

	<p>fiscal year. Permanent employees are defined as all paid employees that are contracted for a term of one or more fiscal years and/or have a guaranteed renewal of their employment contract and that work 8 or more hours per day.</p> <p>Source: World Bank Enterprise Surveys (<a href="http://www.enterprisesurveys.org">www.enterprisesurveys.org</a>)</p>
Temporary employment	<p>Number of temporary employees in the last fiscal year. Temporary workers are defined as all paid short-term (i.e. for less than a fiscal year) employees with no guarantee of renewal of contract employment and that work 8 or more hours per day.</p> <p>Source: World Bank Enterprise Surveys (<a href="http://www.enterprisesurveys.org">www.enterprisesurveys.org</a>)</p>
Outage	<p>Total number of hours of power failure faced by a store per day in a typical month.</p> <p>Source: World Bank Enterprise Surveys (<a href="http://www.enterprisesurveys.org">www.enterprisesurveys.org</a>)</p>
Wage rate	<p>State level average wage rate of workers employed in all factories in the registered manufacturing sectors.</p> <p>Source: Annual Survey of Industries, 2003-04.</p>
Formal competition	<p>A dummy variable equal to 1 if a store reported important or fairly important and 0 otherwise for the following question:</p> <p>For this store how important is the pressure/influence from domestic competitors (in the formal sector) for prices of its main products: not at all important, slightly important, fairly important or important.</p> <p>Source: World Bank Enterprise Surveys (<a href="http://www.enterprisesurveys.org">www.enterprisesurveys.org</a>)</p>
Sex ratio	<p>Ratio of females to males in the city in 2001.</p> <p>Source: Census of India, 2001.</p>
Literacy	<p>Percentage of adults in the state who are literate in 2001.</p> <p>Source: Census of India, 2001.</p>
Population	<p>Total adult population of the city in 2001 (in millions).</p> <p>Source: Census of India, 2001.</p>
Expenditure	<p>Mean per capita expenditure of the urban-district population in 1999-2000. Districts are larger than the cities and the urban part of the district more closely approximates the cities in our sample. The variable is expressed in thousand Indian Rupees.</p> <p>Source: National Sample Survey Organization (NSSO), 55<sup>th</sup> round, 1999-2000.</p>
Business Regulations	<p>In one survey question, stores were asked the following: Is/Are the following No obstacle (0), Minor obstacle (1), Moderate obstacle (2), Major obstacle (3) or Very severe obstacle (4) to the current operations and growth of the store? Tax rates, Tax administration, Corruption, Access to Land, Business</p>

	<p>licensing and permits, Regulations on hours of operation, Regulations on pricing &amp; mark-ups. The index is the average at the state level of the reported scores on the question.</p> <p>Source: World Bank Enterprise Surveys (<a href="http://www.enterprisesurveys.org">www.enterprisesurveys.org</a>)</p>
<i>Time</i>	<p>Percentage of store's senior management's time that is spent in dealing with various business regulations.</p> <p>Source: World Bank Enterprise Surveys (<a href="http://www.enterprisesurveys.org">www.enterprisesurveys.org</a>)</p>
<i>Theft</i>	<p>A dummy variable equal to 1 if a store reported an incidence of theft in the last fiscal year and 0 otherwise.</p> <p>Source: World Bank Enterprise Surveys (<a href="http://www.enterprisesurveys.org">www.enterprisesurveys.org</a>)</p>
Store-type fixed effect	<p>A set of two dummy variables indicating whether a store is a traditional store or a consumer durable store. Traditional stores include grocers, general stores, chemists, food stores, cosmetic stores, etc. Consumer durable stores sell consumer items. The omitted category is the set of remaining stores which are modern format stores (large stores part of a bigger shopping complex).</p> <p>Source: World Bank Enterprise Surveys (<a href="http://www.enterprisesurveys.org">www.enterprisesurveys.org</a>)</p>
<i>Size</i>	<p>Total selling area of the store measured in square feet (log values)</p> <p>Source: World Bank Enterprise Surveys (<a href="http://www.enterprisesurveys.org">www.enterprisesurveys.org</a>)</p>

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**Table 2:** Minimum wages as of 12/31/2001 in Indian Rupees (Rs)

State	Shops and Establishments Act	Oil mills industry	Powerloom Industry	Glass industry
Andhra Pradesh	58.7	78.77	61.73	57.50
Bihar	61.98	61.98	61.98	61.98
Delhi	99.70	99.70	N.A	99.70
Gujarat	83.6	80.00	79.20	75.40
Haryana	75.84	75.84	N.A	75.84
Karnataka	70.38	69.13	70.54	70.53
Kerala	84.46	114.73	65.78	N.A
Madhya Pradesh	74.73	74.73	74.73	74.73
Maharashtra	62.60	75.86	71.82	51.25
Orissa	42.50	42.50	42.50	42.50
Punjab	78.28	78.28	78.28	N.A
Rajasthan	60.00	60.00	60.00	60.00
Tamil Nadu	68.60	62.63	52.87	N.A
Uttar Pradesh	77.97	77.97	71.73	79.35
West Bengal	79.43	78.75	67.81	80.08
Jharkhand	N.A	N.A	N.A	N.A

1. Source: "Report on the Working of the Minimum Wages Act., 1948 for the year 2001", Labor Bureau, Government of India. The report is available at <http://labourbureau.nic.in/MW2K1%20Main%20Page.htm>

2. N.A: Data not reported or not available.

3. 2001 is the latest year for which data is easily available for most of the states in our sample.

4. 1 Rs = .025 USD as on 02/06/2008.

**Table 3:** Summary statistics and correlations for the main explanatory variables

	Mean	Standard deviation
<i>Regulation index</i>	0.067	1.53
<i>Enforcement index</i>	0.345	0.194
<i>Income</i> (log values)	9.3	0.506
<i>Wage rate</i> (Thousand Rupees)	0.179	0.725
<i>Population</i> (millions)	1.93	2.39
<i>Age</i>	14.5	12.8

Correlation between main explanatory variables

	<i>Regulation index</i>	<i>Enforcement index</i>	<i>Income</i>	<i>Wage rate</i>	<i>Population</i>
<i>Regulation index</i>	1				
<i>Enforcement index</i>	0.473	1			
<i>Income</i>	0.060	0.237	1		
<i>Wage rate</i>	0.283	0.041	-0.080	1	
<i>Population</i>	0.332	0.303	0.222	0.012	1
<i>Age</i>	0.082	0.138	0.016	0.039	0.040

**Table 4:** The Effect of Labor Regulation on Employment

Dependent variable: <i>Employment</i>					
	(1)	(2)	(3)	(4)	(5)
<i>Regulation index</i>	-0.471** (0.012)	-0.511*** (0.003)	-0.426*** (0.004)	-0.472*** (0.003)	-0.499*** (0.006)
<i>Income</i>		0.969 (0.131)	0.960 (0.137)	0.844 (0.204)	0.838 (0.227)
<i>Wage rate</i>			-5.45** (0.040)	-5.35** (0.026)	-5.40** (0.046)
<i>Population</i>				0.070 (0.469)	0.069 (0.495)
<i>Age</i>					0.042* (0.098)
R <sup>2</sup>	0.006	0.007	0.008	0.008	0.011
Sample Size	1818	1818	1818	1818	1818
p-values in brackets. All standard errors are Huber-White robust and clustered on the state. Significance levels are denoted by: *** (1% or less), ** (5% or less) and * (10% or less). Sample size varies due to missing observations.					

**Table 5:** The Effect of Labor Regulation on Employment

Dependent variable: <i>Employment</i>					
	(1)	(2)	(3)	(4)	(5)
<i>Enforcement</i> index	-3.28** (0.030)	-3.44** (0.025)	-2.97** (0.042)	-2.94** (0.038)	-3.45** (0.023)
<i>Income</i>		0.374 (0.511)	0.362 (0.554)	0.374 (0.572)	0.366 (0.590)
<i>Wage rate</i>			-8.09* (0.058)	-8.08* (0.056)	-8.24* (0.059)
<i>Population</i>				-0.004 (0.962)	0.003 (0.976)
<i>Age</i>					0.047** (0.042)
R <sup>2</sup>	0.004	0.004	0.006	0.006	0.009
Sample Size	1927	1927	1927	1927	1927
p-values in brackets. All standard errors are Huber-White robust and clustered on the state. Significance levels are denoted by: *** (1% or less), ** (5% or less) and * (10% or less). Sample size varies due to missing observations.					

**Table 6:** The Effect of Labor Regulation on Employment

Dependent variable: <i>Employment</i>				
	(1)	(2)	(3)	(4)
<i>Regulation</i>	-0.441**	-0.328**	-0.317**	-0.345**
<i>index</i>	(0.028)	(0.024)	(0.035)	(0.032)
<i>Income</i>	0.290	-0.010	0.723	-0.437
	(0.751)	(0.993)	(0.416)	(0.361)
<i>Wage rate</i>	-7.23***	-5.99**	-4.74**	3.54
	(0.026)	(0.029)	(0.011)	(0.177)
<i>Population</i>	0.077	0.031	0.094	0.021
	(0.421)	(0.689)	(0.171)	(0.695)
<i>Age</i>	0.044*	0.048**	0.047**	0.042***
	(0.075)	(0.046)	(0.024)	(0.007)
<i>Literacy</i>	0.096	0.066	-0.038	-0.129
	(0.426)	(0.598)	(.671)	(0.144)
<i>Sex ratio</i>	1.26	0.587	8.02	3.07
	(0.887)	(0.939)	(0.177)	(0.469)
<i>Expenditure</i>	0.247	2.55	1.94	3.71*
	(0.927)	(0.422)	(0.539)	(0.090)
<i>Business regulations</i>		-1.05	-0.660	-0.461
		(0.163)	(0.309)	(0.424)
<i>Theft</i>		-6.12	-3.81	-4.47
		(0.171)	(0.394)	(0.189)
<i>Outage</i>			0.047	-0.0003
			(0.534)	(0.997)
<i>Non payment</i>			-0.175***	-0.049*
			(0.000)	(0.076)
<i>Formal competition</i>			0.462	-0.165
			(0.123)	(0.568)
Store-type fixed effects				Yes
<i>Time</i>				0.148*
				(0.066)
<i>Size</i>				2.85***
				(0.000)
R <sup>2</sup>	0.012	0.014	0.024	0.297
Sample Size	1818	1818	1771	1761

p-values in brackets. All standard errors are Huber-White robust and clustered on the state. Significance levels are denoted by: \*\*\* (1% or less), \*\* (5% or less) and \* (10% or less). Sample size varies due to missing observations.



**Table 7:** The Effect of Labor Regulation on Employment

Dependent variable: <i>Employment</i>				
	(1)	(2)	(3)	(4)
<i>Enforcement index</i>	-2.92** (0.032)	-4.05** (0.021)	-4.05** (0.023)	-2.82** (0.030)
<i>Income</i>	-0.085 (0.924)	-0.371 (0.726)	-0.336 (0.748)	-0.965 (0.107)
<i>Wage rate</i>	-7.75** (0.019)	-6.15** (0.014)	-6.23*** (0.008)	2.29 (0.375)
<i>Population</i>	0.067 (0.350)	0.128 (0.153)	0.133 (0.127)	0.046 (0.488)
<i>Age</i>	0.048** (0.036)	0.053*** (0.010)	0.050*** (0.010)	0.038*** (0.007)
<i>Literacy</i>	0.054 (0.640)	0.018 (0.816)	-0.006 (0.945)	-0.138* (0.070)
<i>Sex ratio</i>	7.22 (0.322)	13.9** (0.043)	14.9** (0.023)	9.32** (0.011)
<i>Expenditure</i>	0.215 (0.927)	1.94 (0.524)	1.77 (0.563)	4.09* (0.051)
<i>Business regulations</i>		1.10 (0.249)	1.14 (0.195)	0.409 (0.552)
<i>Theft</i>		-6.30 (0.139)	-6.19 (0.187)	-5.82 (0.134)
<i>Outage</i>			0.033 (0.596)	-0.003 (0.956)
<i>Non payment</i>			-0.173*** (0.000)	-0.063** (0.018)
<i>Formal competition</i>			0.364 (0.181)	-0.235 (0.418)
Store-type fixed effects				Yes
<i>Time</i>				0.143* (0.059)
<i>Size</i>				2.76*** (0.000)
R <sup>2</sup>	0.012	0.019	0.023	0.298
Sample Size	1927	1927	1876	1865

p-values in brackets. All standard errors are Huber-White robust and clustered on the state. Significance levels are denoted by: \*\*\* (1% or less), \*\* (5% or less) and \* (10% or less). Sample size varies due to missing observations.

**Table 8:** Temporary vs. Permanent Employment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	<u>Permanent Employment</u>				<u>Temporary Employment</u>			
<i>Regulation index</i>	-0.378*** (0.010)	-0.320*** (0.007)			-0.093* (0.098)	-0.057 (0.337)		
<i>Enforcement index</i>			-2.96** (0.012)	-2.49*** (0.009)			-0.317 (0.508)	-0.179 (0.723)
<i>Income</i>		-0.075 (0.869)		-0.784 (0.209)		-0.074 (0.577)		-0.102 (0.415)
<i>Wage rate</i>		1.47 (0.291)		-0.074 (0.954)		-1.01 (0.438)		-1.22 (0.352)
<i>Population</i>		0.054 (0.103)		0.058 (0.204)		-0.001 (0.966)		-0.003 (0.928)
<i>Age</i>		0.045*** (0.008)		0.044*** (0.004)		0.015** (0.035)		0.014** (0.043)
<i>Literacy</i>		-0.048 (0.483)		-0.037 (0.564)		0.017 (0.698)		0.012 (0.743)
<i>Sex ratio</i>		1.84 (0.498)		7.53*** (0.009)		1.14 (0.566)		1.95 (0.258)
<i>Expenditure</i>		3.52** (0.036)		3.43* (0.073)		-0.040 (0.944)		0.051 (0.903)
<i>Business regulations</i>		-0.768 (0.133)		0.237 (0.668)		0.337 (0.205)		0.329 (0.275)
<i>Theft</i>		-4.06* (0.093)		-5.73* (0.070)		-2.55** (0.036)		-2.66** (0.024)
<i>Outage</i>		0.015 (0.735)		0.012 (0.781)		0.046 (0.143)		0.048* (0.099)
<i>Non payment</i>		-0.047** (0.019)		-0.061*** (0.003)		-0.019* (0.059)		-0.021** (0.029)
<i>Formal competition</i>		0.068 (0.798)		0.004 (0.986)		-0.177 (0.130)		-0.176 (0.101)
<i>Store-type fixed effects</i>		Yes		Yes		Yes		Yes
<i>Time</i>		0.188*** (0.004)		0.181*** (0.004)		0.045*** (0.005)		0.042*** (0.006)
R <sup>2</sup>	0.005	0.218	0.004	0.219		0.071	0.008	0.072
Sample Size	1818	1770	1927	1874		1770	1927	1874

p-values in brackets. All standard errors are Huber-White robust and clustered on the state. Significance levels are denoted by: \*\*\* (1% or less), \*\* (5% or less) and \* (10% or less). Sample size varies due to missing observations. Dependent variable in columns 1-4 is permanent employment and temporary employment in columns 5-8.

**Table 9:** The Effect of Labor Regulation on Informality  
Marginal effects from logit regressions

Dependent variable: <i>Informality</i>	(1)	(2)	(3)	(4)	(5)	(6)
<i>Regulation index</i>	0.032** (0.050)	0.045*** (0.000)	0.028*** (0.000)			
<i>Enforcement index</i>				0.288** (0.020)	0.346*** (0.002)	0.227*** (0.001)
<i>Literacy</i>		-0.007** (0.018)	-0.006 (0.231)		-0.004 (0.383)	-0.005 (0.188)
<i>Population</i>		-0.019** (0.027)	-0.008** (0.024)		-0.012** (0.029)	-0.009* (0.054)
<i>Formal competition</i>			0.221*** (0.000)			0.241*** (0.000)
<i>Age</i>			-0.0003 (0.680)			-0.0003 (0.654)
<i>Income</i>			0.612 (0.854)			4.25** (0.036)
<i>Sex ratio</i>			0.541** (0.048)			0.125 (0.705)
<i>Size</i>			-0.018** (0.028)			-0.021** (0.011)
<i>Wage rate</i>			0.026 (0.805)			0.125 (0.254)
<i>Theft</i>			0.648*** (0.001)			0.700*** (0.000)
<i>Business regulations</i>			0.075*** (0.004)			0.017 (0.689)
<i>Time</i>			0.002 (0.117)			0.002 (0.118)
<i>Outage</i>			-0.002 (0.616)			-0.002 (0.602)
Store-type fixed effects			Yes			Yes
Predicted probability	0.169	0.161	0.125	0.170	0.167	0.128
Sample Size	1667	1667	1657	1763	1763	1742

p-values in brackets. All standard errors are Huber-White robust and clustered on the state.  
Significance levels are denoted by: \*\*\* (1% or less), \*\* (5% or less) and \* (10% or less).

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### Summary Findings

A new dataset of 1,948 retail stores in India shows that 27% of the stores find labor regulations as a problem for their business. Using these data, we analyze the effect of labor regulations on employment at the store level. We find that flexible labor regulations have a strong positive effect on job creation. Our estimates show that labor reforms are likely to increase employment by 22% of the current level for an average store. We also address the issue of informality in India's retail sector. Our findings suggest that more flexible labor laws can encourage firms to operate in the more efficient formal retail sector. According to our estimates, labor reforms could reduce the level of informality by as much as 33%.

HUMAN DEVELOPMENT NETWORK

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